

DESIGNING FOR SAFETY

Purpose:

This activity calls upon students to model the development and engineering of transportation casks for spent fuel assemblies.

Concepts:

1. When designing a cask to transport spent nuclear fuel, engineers consider the most extreme conditions of temperature and pressure.
2. Tests verify engineering design.

Duration of Lesson:

One 50-minute class period

Objectives:

As a result of participation in this lesson, the learner will be able to:

1. design and build a "cask" for a raw egg;
2. demonstrate the integrity of his/her cask design; and
3. explain important factors engineers must consider when designing a cask for the transport of spent nuclear fuel.

Skills:

Constructing, designing, drawing, evaluating, observing, testing, working in groups

Vocabulary:

Cask

Materials:

Activity Sheets

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Other

- 1 raw egg (per group)
- 2 sheets of 8 1/2"x11" paper (per group)
- 1 meter of tape (per group)
- plastic sheet
- meter stick

Suggested Procedure:

1. It is suggested that students work in groups of two to four to derive maximum benefit from this experiment. Each student should be prepared to make predictions, set up the experiment, and record data as the experiment progresses.
2. Students should follow directions listed in the activity to build the protective "cask" around their eggs.
3. After the test drop, give each group time to look at the successful casks and record their observations.
4. Have students draw their conclusions.
5. You may wish to ask groups to share and discuss their conclusions with the class.

Teacher Evaluation of Learner Performance:

Completion of experiment and worksheet will indicate understanding.